SOCIO-ECONOMIC PLANNING SCIENCES

An International Journal

. 12
978

List of Contents and Author Index

Volume 12, 1978

PERGAMON PRESS

OXFORD NEW YORK PARIS FRANKFURT

Socio-Economic Planning Sciences *An International Journal*

Editor-in-Chief SUMNER N. LEVINE, W. Averell Harriman College for Urban and Policy Sciences, State University of New York, Stony Brook, NY 11794

Editorial Board

ALFRED BLUMSTEIN,
Carnegie Mellon Institute, Pittsburgh, Pennsylvania

MELVILLE BRANCH
Graduate Program of Urban and Regional Planning,
University of Southern California,
Los Angeles, California

J. R. CANADA,
Industrial Engineering Department, North Carolina
State University, Raleigh, NC 27607

HECTOR CORREA,
Graduate School of Public and International Affairs,
University of Pittsburgh, Pittsburgh, PA 15260

HAIM DARIN-DRABKIN
Institute for Land Resources Planning,
Tel-Aviv

JOHN W. DYCKMAN,
Center for Planning and Development Research,
University of California, Berkeley, California

DONALD ERLENKOTTER,
Graduate School of Management,
University of California, Los Angeles, California

GERALD GARVEY
Woodrow Wilson School, Princeton University,
Princeton, NJ 08540

MICHAEL R. GREENBERG,
Livingston College, Rutgers University,
North Brunswick, NJ 08903

SHIV K. GUPTA
Department of Statistic and Operations Research,
Wharton School, University of Pennsylvania,
Philadelphia, Pennsylvania

BRITTON HARRIS,
University of Pennsylvania, Philadelphia, Pennsylvania

IAN G. HEGGIE,
Transport Studies Unit, Oxford University, Oxford

LESTER A. HOEL,
Department of Civil Engineering, University
of Virginia, Charlottesville, VA 22901

RONALD A. HOWARD,
Department of Engineering-Economic Systems,
Stanford University, Stanford, California

FRANKLIN J. JAMES,
Department of Housing and Urban Development,
Washington DC 20410

LEE KOPPELMAN,
Nassau-Suffolk Regional Planning Board,
Hauppauge, New York

KENNETH L. KRAEMER,
Public Policy Research Organization,
University of California,
Irvine, CA 92717

JOSEPH A. MACIARIELLO
Institute of Administration and Management,
Union College,
Schenectady, NY 12308

LAWRENCE D. MANN,
Department of City and Regional Planning,
Harvard University, Cambridge, Massachusetts

JOHN R. MEYER,
Morgan Hall 322, Harvard Business School,
Boston, MA 02163

MARTIN MEYERSON,
University of Pennsylvania,
Philadelphia, Pennsylvania

EDMUND D. PELLEGRINO,
Yale–New Haven Medical Center, Inc.,
New Haven, CT 06510

GEORGE M. RAYMOND,
Raymond, Parrish, Pine and Weiner,
Tarrytown, NY 10591

IRA ROBINSON,
Center for Metropolitan Planning and Research,
Johns Hopkins University, Baltimore, MD 71718

THOMAS L. SAATY,
Wharton School, University of Pennsylvania,
Philadelphia, PA 19104

GORAN SIDENBLADH,
Stockholm Stads Stadsbyggnadskontor,
Teknska Namndhuset, Stockholm

HARRY WEINER,
W. Averell Harriman College for Urban and
Policy Sciences,
State University of New York,
Stony Brook, NY 11794

Administrative Editor

CAROLINE LEVINE
State University of New York at Stony Brook,
Stony Brook, NY 11794

Vol. 12
1978

Annual Subscription Rates (1979) Published bi-monthly
For libraries, university departments, government laboratories, industrial and other multiple-reader institutions US $80.00 per annum (including postage and insurance).

Specially Reduced Rates to Individuals
In the interests of maximizing the dissemination of the research results published in this important international journal we have established a two-tier price structure. Any individual whose institution takes out a library subscription may purchase a second or additional subscription for personal use at the much reduced rate of US $30.00. All subscription enquires should be addressed to: The Subscription Fulfillment Manager, Headington Hill Hall, Oxford OX3 0BW, England.

Microform Subscriptions and Back Issues
Back issues of all previously published volumes are available in the regular editions and on microfilm and microfiche. Current subscriptions are available on microfiche simultaneously with the paper edition and on microfilm on completion of the annual index at the end of the subscription year.

Publishing Office: 84–86, Malahide Road, Coolock, Dublin 5, Republic of Ireland
Advertising Offices: *American Continent*: Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A.
Rest of the World: Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW England

Copyright © 1978, Pergamon Press Ltd.

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

U.S. COPYRIGHT LAW APPLICABLE TO USERS IN THE U.S.A.

The Article Fee Code on the first page of an article in this journal indicates the copyright owner's consent that in the U.S.A. copies may be made for personal or internal use provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid. The appropriate remittance should be forwarded with a copy of the first page of the article to the Copyright Clearance Centre Inc., PO Box 765, Schenectady, NY 12301, U.S.A. If a code does not appear copies of the article may be made without charge, provided permission is obtained from the publisher. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works or for resale. Specific written permission must be obtained from the publisher for such copying. In case of doubt please contact your nearest Pergamon office.

LIST OF CONTENTS

NUMBER 1

Kingsley E. Haynes and James E. Storbeck: The entropy paradox and the distribution of urban population 1
Stephen F. Jablonsky: A cost-effectiveness approach to planning and control for the nonprofit organization—a university example 7
George C. Yorke, O. Allan Gianniny, Jr. and Andrew P. Sage: On the application of systems engineering methodology to emergency communication system program planning 17
Roger H. Bezdek and Arlene K. Shapiro: Empirical tests of input–output forecasts 29
Harpal S. Dhillon, Alfred C. Doermann and Philip Walcoff: Telemedicine and rural primary health care: an analysis of the impact of telecommunications technology 37
M. J. Hodgson and P. Doyle: The location of public services considering the mode of travel 49

NUMBER 2

I. Brosh, E. Turban and E. Shlifer: Optimal policies in the delivery of human services 55
V. K. Smith: Economic growth—meritorious or meretricious: a reivew of *Social Limits to Growth* . 61
John W. Foley and Homer R. Steedly: Measuring local health care system development for public policy purposes: an exploratory analysis of physicians and hospitals 67
Peter Gordon and John H. Niedercorn: A procedure for fully evaluating the anticipated impacts of selected public system innovations on various environments using citizen-generated information inputs 77
Robert J. Lavers and David K. Whynes: A production function analysis of English maternity hospitals 85
Noel D. Uri: Planning the production of electrical energy 95

NUMBER 3

Robert A. Leone: Some complications in the measurement of environmental control impacts: a case study of water pollution controls 103
O. Ozoro: A mathematical programming model for planning training opportunities in relation to manpower targets for development 113
T. A. Lambe, M. I. Risen and H. J. Stewardson: Economic factors of investment in parking facilities . 121
C. C. Pegels: Operations research in the management of regional blood services 129
Hector Correa: The human resources approach to manpower, education and income distribution planning 135
Timothy W. Ruefli, Jane C. Ruefli, Harold O'Neil and Caroline M. Smith: A scheduling strategy for computer-managed instructional systems 145
Hugh A. McCoy and Joseph F. Singer: Research notes on socioeconomic site dynamics 153
V. K. Smith: Duality principles and measuring the production technology: a heuristic introduction . 161

NUMBER 4

Lawrence Busch and Christopher Dale: The changing distribution of physicians 167
Don C. I. Okpala: Urban ecology and residential location theories: application in Nigeria's socio-cultural milieu 177
Arie P. Schinnar: Eigenstructure, multiplier and game characterizations of administrative personnel requirements and activities 185
Rolf R. Schmitt: Threats to validity involving geographic space 191
Jean-Michel Guldmann: Industrial location, air pollution control and meteorological variability: a dynamic optimization approach 197

NUMBER 5

Robert S. Sullivan and James A. Fitsimmons: A goal programming model for readiness and the optimal redeployment of resources 215
Peter T. Ittig: An optimization model for planning community health services 221
Robert P. Cerveny, Vijay Mahajan and Robert A. Ludwig: Management information systems in health systems agencies: some considerations 229
Donald Nudds and Anthony Bottomley: Effluent disposal: treatment works or sea outfall? 237
Thomas E. Ramsay, Jr. and Richard D. Wright: Impacts of health maintenance organization growth on community health care costs 241

H. P. L. Luna: Two-level national-regional planning and mathematical programming decomposition applied to spatial price equilibrium models 251
Edward L. Hannan: The application of goal programming techniques to the CPM problem 267
Donald B. Pittenger: The role of judgment, assumptions, techniques, and confidence limits in forecasting population 271
John Tydeman and Robert Mitchell: Policy evaluation under uncertainty: an approach using subjective information 277
Akin Iwayemi: An investment planning model for the electricity sector in Nigeria 285

Note
Grace L. Yang and Martin K. Chen: Note on weighted kappa 293

NUMBER 6

Martin K. Chen: A quantitative index of access to primary medical care for health planning 295
Ian Plewis: Planning pre-school services: a socio-demographic analysis 303
James R. Burns and Onur Ulgen: An integrated approach to the development of continuous simulations 313
Derek W. Bunn: Screening methods in policy analysis 329
Michael K. Buckland: Ten years progress in quantitative research on libraries 333
Hubert Law-Yone: The simulation of planning decisions 341
Dieter Weiss: Economic evaluation of projects. A critical comparison of a new world bank methodology with the UNIDO and the revised OECD approach 347

Vol. 1
1978

AUTHOR INDEX

Allan Gianniny, Jr., O., 17

Bezdek, R. H., 29
Bottomley, A., 237
Brosh, I., 55
Buckland, M. K., 333
Bunn, D. W., 329
Burns, J. R., 313
Busch, L., 167

Cerveny, R. P., 229
Chen, M. K., 293, 295
Correa, H., 135

Dale, C., 167
Dhillon, H. S., 37
Doermann, A. C., 37
Doyle, P., 49

Fitsimmons, J. A., 215
Foley, J. W., 67

Gordon, P., 77
Guldmann, J., 197

Hannan, E. L., 267
Haynes, K. E., 1
Hodgson, M. J., 49

Ittig, P. T., 221
Iwayemi, A., 285

Jablonsky, S. F., 7

Lambe, T. A., 121
Lavers, R. J., 85
Law-Yone, H., 341
Leone, R. A., 103
Ludwig, R. A., 229
Luna, H. P. L., 251

Mahajan, V., 229
McCoy, H. A., 153
Mitchell, R., 277

Niedercorn, J. H., 77
Nudds, D., 237

Okpala, D. C. I., 177
O'Neil, H., 145
Ozoro, O., 113

Pegels, C. C., 129
Pittenger, D. B., 271
Plewis, I., 303

Ramsay, Jr., T. E., 241
Risen, M. I., 121
Ruefli, J. C., 145
Ruefli, T. W., 145

Sage, A. P., 17
Schinnar, A. P., 185
Schmitt, R. R., 191
Shapiro, A. K., 29
Shlifer, E., 55
Singer, J. F., 153
Smith, C. M., 145
Smith, V. K., 67, 161
Steedly, H. R., 67
Stewardson, H. J., 121
Storbeck, J. E., 1
Sullivan, R. S., 215

Turban, E., 55
Tydeman, J., 277

Ulgen, O., 313
Uri, N. D., 95

Walcoff, P., 37
Weiss, D., 347
Whynes, D. K., 85
Wright, R. D., 241